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A REPORT ON AN ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED SOLAR ENERGY PLANT ON KLEIN ZWART BAST 188, KENHARDT DISTRICT, NORTHERN CAPE

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DISCLAIMER:

Although all possible care is taken to identify all sites of cultural importance during the survey of study areas, the nature of archaeological and historical sites are as such that it always is possible that hidden or subterranean sites could be overlooked during the study. Archaetnos and its personnel will not be held liable for such oversights or for costs incurred as a result thereof.

The South African Heritage Resources Agency (SAHRA) or one of its subsidiary bodies needs to comment on this report and clients are advised not to proceed with any action before receiving these.

SUMMARY

Archaetnos cc, in conjunction with Robert de Jong & Associates, was appointed by EScience & Associates, on behalf of Aurora Power Solutions, to conduct an Archaeological Impact Assessment as part of the Basic Heritage Impact Assessment (HIA) for a proposed Solar Energy Plant on the farm Klein Zwart Bast 188 (Farm De Hoek, Portion 1 of Klein Zwart Bast), in the Kenhardt District of the Northern Cape Province.

A number of archaeological sites, features and objects of significance were identified during the assessment. Most of the sites and finds date to the Stone Age, although there were some historical finds as well. The report gives a discussion of these finds and observations made during the fieldwork and also gives an indication of the methodology followed. It also indicates how to deal with any archaeological material that may be unearthed or disturbed during the development activities.

Mitigation measures to minimize the impact of the development on the sites that were located during the assessment are put forward at the end of this report. Once these have been implemented the development, from an Archaeological perspective, can continue.

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1. INTRODUCTION

Archaetnos cc, in conjunction with Robert de Jong & Associates, was appointed by EScience & Associates, on behalf of Aurora Power Solutions, to conduct an Archaeological Impact Assessment as part of the Basic Heritage Impact Assessment (HIA) for a proposed Solar Energy Plant on the farm Klein Zwart Bast 188 (Farm De Hoek, Portion 1 of Klein Zwart Bast), in the Kenhardt District of the Northern Cape Province.

The specialists were accompanied by the client (EScience and Aurora Power Solutions), who indicated the boundaries of the area to be surveyed. The work was confined to this area.

2. TERMS OF REFERENCE

The Terms of Reference for the survey were to:

1. Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located in the area of the proposed development (**see Appendix A**).

2. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value (**see Appendix B**).

3. Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions.

4. Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources, should this be applicable.

5. Review applicable legislative requirements.

3. CONDITIONS & ASSUMPTIONS

The following conditions and assumptions have a direct bearing on the survey and the resulting report:

1. Cultural Resources are all non-physical and physical man-made occurrences, as well as natural occurrences associated with human activity. These include all sites, structure and artifacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development. Graves and cemeteries are included in this.

2. The significance of the sites, structures and artifacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects.
3. Cultural significance is site-specific and relates to the content and context of the site. Sites regarded as having low cultural significance have already been recorded in full and require no further mitigation. Sites with medium cultural significance may or

may not require mitigation depending on other factors such as the significance of impact on the site. Sites with a high cultural significance require further mitigation (see Appendix B).

4. The latitude and longitude of any archaeological or historical site or feature, is to be treated as sensitive information by the developer and should not be disclosed to members of the public.

5. All recommendations are made with full cognizance of the relevant legislation.

6. It has to be mentioned that it is almost impossible to locate all the cultural resources in a given area, as it will be very time consuming. Developers should however note that the report should make it clear how to handle any other finds that might be found.

4. LEGISLATIVE REQUIREMENTS

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

4.1 The National Heritage Resources Act

According to the above-mentioned act the following is protected as cultural heritage resources:

a. Archaeological artifacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites or scientific or technological value.

The national estate (**see Appendix D**) includes the following:

a. Places, buildings, structures and equipment of cultural significance
b. Places to which oral traditions are attached or which are associated with living heritage
c. Historical settlements and townscapes
d. Landscapes and features of cultural significance
e. Geological sites of scientific or cultural importance
f. Sites of Archaeological and palaeontological importance
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources. An HIA must be done under the following circumstances:

a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
b. The construction of a bridge or similar structure exceeding 50m in length
c. Any development or other activity that will change the character of a site and exceed 5 000m^2 or involve three or more existing erven or subdivisions thereof
d. Re-zoning of a site exceeding 10 000 m^2
e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

Structures

Section 34 (1) of the mentioned act states that no person may demolish any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Alter means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or the decoration or any other means.

Archaeology, palaeontology and meteorites

Section 35(4) of this act deals with archaeology, palaeontology and meteorites. The act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial):

a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
b. **destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite**;
c. trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
d. bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

Human remains

Graves and burial grounds are divided into the following:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

a. destroy, damage, alter, exhume or remove from its original position of otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
b. destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
c. bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Excavations** (**Ordinance no. 12 of 1980**) (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the **Human Tissues Act** (**Act 65 of 1983 as amended**).

Unidentified/unknown graves are also handled as older than 60 until proven otherwise.

4.2 The National Environmental Management Act

This act states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The

impact of the development on these resources should be determined and proposals for the mitigation thereof are made.
Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

5. METHODOLOGY

5.1 Survey of literature

A survey of literature was undertaken in order to obtain background information regarding the archaeology of the area. Sources consulted in this regard are indicated in the bibliography.

5.2 Field survey

The survey was conducted according to generally accepted HIA/AIA practices and was aimed at locating all possible objects, sites and features of cultural (archaeological and historical) significance in the area of proposed development. If required, the location/position of any site is determined by means of a Global Positioning System (GPS), while photographs are also taken where needed.

The survey was undertaken mainly on foot

5.3 Oral histories

People from local communities are sometimes interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography. **In this case no oral histories were recorded.**

5.4 Documentation

All sites, objects, features and structures identified are documented according to the general minimum standards accepted by the archaeological profession. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS).The information is added to the description in order to facilitate the identification of each locality.

6. DESCRIPTION OF THE AREA

The project area is located on the farm Klein Zwart Bast 188 (Farm De Hoek, Portion 1 of Klein Zwart Bast), in the Kenhardt District of the Northern Cape Province. It is situated close to ESKOM's Aries Substation.

The area is fairly flat and open, with sections of grass, shrubs and small trees the main vegetation cover. Large portions of the area contains huge numbers of stone (river pebbles etc), and it is here where most of the Stone Age material identified in the area is located. There are a number of small outcrops in the area, while a dry riverbed cuts the area roughly in two sections. As a result of the open nature of the landscape, archaeological visibility is

fairly high. The archaeological sites, features and artifacts identified are scattered throughout the area, covering nearly the full extent of the assessment area.

Figure 1: Aerial location of development (© Google 2010)

Figure 2: Closer view of the development location.
The red block indicates the area assessed, with the Aries substation also visible

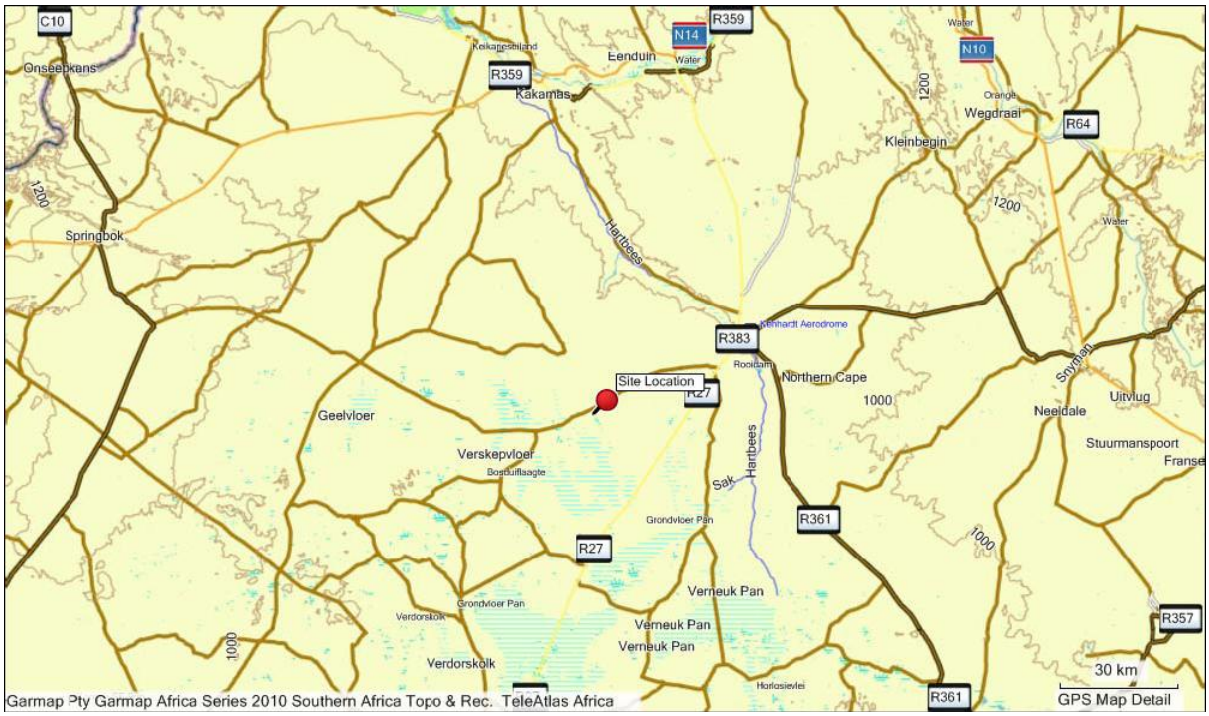

Figure 3: Topographic Location of development (© Map Source 2010)

Figure 4: General view of the area taken from Aries Substation. Note the large number of stones covering most of the area

Figure 5: One of the small outcrops/heights in the area. Stone Age finds are also located here

7. DISCUSSION

During the assessment a number of sites, features and objects of archaeological nature were located in the area. In order to enable the reader to understand archaeological objects, features and sites that could possibly be unearthed and disturbed during development, it is necessary to give a background regarding the different phases of human history.

7.1 Stone Age

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools (Coertze & Coertze 1996: 293). In South Africa the Stone Age can be divided in three periods. **It is however important to note that dates are relative and only provide a broad framework for interpretation**. The division for the Stone Age according to Korsman & Meyer (1999: 93-94) is as follows:

Early Stone Age (ESA) 2 million – 150 000 years ago
Middle Stone Age (MSA) 150 000 – 30 000 years ago
Late Stone Age (LSA) 40 000 years ago – 1850 - A.D.

According to David Morris of the McGregor Museum in Kimberley the archaeology of the Northern Cape is rich and varied, covering long spans of human history. The Karoo is particularly bountiful. Some areas are richer than others, and not all sites are equally significant. The significance of sites encountered in the study area may be assessed against previous research in the region and subcontinent. The region's remoteness from research institutions accounts for a relative lack of archaeological research in the area. The area has probably been relatively marginal to human settlement for most of its history, yet it is in fact exceptionally rich in terms of Stone Age sites and rock art, as a relatively few but important studies have shown (Morris 2006: 1; 3).

In his 2006 report (Archaeological Specialist Input for the Aries-Garona Transmission Powerline) Morris indicates that in the vicinity of Olywen Kolk and **Klein Zwart Bast**, the farms at the southwestern most end of the proposed line, the terrain is characterized by Dwyka tillite, known to be a favoured source of raw materials in Earlier Stone Age times. He does indicate that the vicinity of the sub station several artifacts were noted amidst the strewn stones that typify the surfaces here (Morris 2006: 6).

Most of the sites, features or objects identified during the assessment date to the Stone Age, although some Historical material and features were also located. The finds will be discussed in more detail further on in the report.

7.2 Iron Age

The Iron Age is the name given to the period of human history when metal was mainly used to produce artifacts (Coertze & Coertze 1996: 346). In South Africa it can be divided in two separate phases according to Van der Ryst & Meyer (1999: 96-98), namely:

Early Iron Age (EIA) 200 – 1000 A.D.
Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007: xiii) however indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

Early Iron Age (EIA) 250 – 900 A.D.
Middle Iron Age (MIA) 900 – 1300 A.D.
Late Iron Age (LIA) 1300 – 1840 A.D.

No known Iron Age archaeological sites are located in the area.

7.3 Historical Age

This section will be discussed by Dr. Robert de Jong in his Heritage Impact Assessment Report, of which this report forms part. The historical finds and features will be discussed in this report however.

Discussion of sites, features or objects found during the assessment

Site 1

This site is represented by a fairly large number of **Early to Middle Stone Age** tools, flakes and cores, scattered over a large area. This site is very typical of all the other Stone Age finds in the area and although localized (concentrated) in places, stone tools are found scattered all over the development area.

GPS Location: S 29 29 38.1 E 20 47 20.6

Significance of site: Medium to High. High density of objects. Will possibly be directly impacted on by development

Site 2

Similar to Site 1. ESA to MSA.

GPS Location: S 29 29 38.5 E 20 47 19.8

Significance of site: Medium – High. Same as Site 1

Site 3

Same as 1 and 2. ESA to MSA.

GPS Location: S 29 29 44.1 E 20 47 17.4

Significance of site: Medium – High. Same as Sites 1 & 2

Site 4

This is another scatter of stone tools, **similar to the others. ESA to MSA.**

GPS Location: S 29 29 46.9 E 20 47 16.1

Significance of site: Medium – High. Same as Sites 1 - 3

Sites 5 & 6

These sites, containing some stone tools, were located near the beginning and end of a modern retaining wall (soil) in the dry riverbed cutting through the property. **The density of Stone Age material was much less here than elsewhere in the area. ESA to MSA.**

GPS Location: S 29 30 07.9 E 20 46 57.3 and S 29 30 11.7 E 20 46 52.4

Significance of site: Low – Medium. Low density of material

Site 7

This site is located on a low rocky outcrop (height) on the property. A number of stone tools, flakes and cores, similar to those found elsewhere were located here (**ESA and MSA**), while an area with Ostrich Egg Shell (OES) fragments, small flakes and tools (**MSA/LSA**) and possible knapping tools (used in the making if the tools) were also found here. It seems as if this area could have been used as a quarry, as well as a camping site.

GPS Location: S 29 30 15.3 E 20 46 50.2

Significance of Site: Medium – High. Density and range of material.

Figure 6: Some MSA tools found scattered in the area.

Figure 7: Some Early and Middle Stone Age tools in the area

Figure 8: A large bifacial tool (ESA)

Figure 9: Small outcrop with MSA/LSA artefacts. Site 7.

Figure 10: OES fragments from Site 7

Site 8

This site is represented by a spent Martini Henry cartridge only. It dates to the late 19th century, and could have its origin with the 1st Koranna War or Anglo-Boer War (**see Robert de Jong's report**)

GPS Location: S 29 30 27.5 E 20 46 57.5

Significance of site: Low. Out of context

Figure 11: Spent Martini Henry cartridge. Site 8.

Site 9

This site is similar to Site 7, and is located on a small hill/outcrop. It contains fragments of OES, small flakes and stone tools and possible knapping tools. **MSA to LSA**.

GPS Location: S 29 30 35.2 E 20 47 07.8

Significance of site: Medium – High

Site 10

This is a possible historical feature, and is a small, stone packed structure on top of the small outcrop. The function and age is not known, but it could be related to the 1st Koranna War or Anglo-Boer War (see Site 8).

GPS Location: S 29 30 35.7 E 20 47 09.6

Significance of site: Medium to High

Figure 12: Small stone packed structure on Site 10.

Site 11

This is another stone packed structure located on the outcrop, close to Site 10. It is semi-circular in shape. The function and age is not known, but it could date to the historical period. No photograph was taken during the assessment.

GPS Location: S 29 30 37.4 E 20 47 11.9

Significance of site: Medium to high

It should be noted that Sites 9 – 11 is seemingly outside the area indicated by the client as the area to be assessed (although located right on the edge of it).

Furthermore, it should also be noted that although GPS coordinates were taken on many locales (Sites), many more sites (scatters and concentrations of stone tools) were not recorded as it became clear during the assessment that most of the area is covered by Stone Age material and that it would be a near impossible task taking the scope and time-frame of the assessment into consideration to mark all the finds. The whole area can therefore be marked as a Stone Age site, with potentially millions of artifacts present. The area is therefore very significant and mitigation measures will have to be implemented before any development takes place.

Figure 13: The distribution of the sites discussed in the report.
Sites 9 – 11 located just outside the area marked in red

8. CONCLUSIONS AND RECOMMENDATIONS

In conclusion it can be stated that the Archaeological Impact Assessment (AIA), as part of the larger HIA, of the area was conducted successfully. A number of archaeological sites, features and objects were identified and recorded in the area, dating from the **Early to Later Stone Ages**, as well as the **Historical** period. **Although some sites (finds) are more localized (concentrations of material), the whole area is covered by scatters of Stone Age artifacts. Potentially many millions of artifacts are present, making the area, from an Archaeological point of view, highly significant**

With little or no archaeological research done previously in the area as well as the fact that there is **so much material present (covering** basically the **totality** of the **assessed area**), it is **recommended that mitigation measures are implemented to minimize the impact of the development on the Stone Age sites in the area**. This would include **systematic sampling** of stone tools, **mapping and drawing** of the sites and finds, as well as **archaeological excavations at Site 7** in order to collect as much material and information on the Stone Age utilization of the area. This mitigation **need not be done for the total area**, but **only in the area earmarked for the solar panel plant (20 hectare area**). As soon as its **precise location** is known these **mitigation measures should be undertaken**. If **Site 7 can be avoided** (**buffer zone placed around the outcrop on which it is located**) **no further mitigation measures** would be **required**. It

is also recommended that an **Information Plaque, containing information on the archaeology and history of the area, be erected at the Solar Panel Plant**.

Finally, it should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts are always a distinct possibility. Care should therefore be taken during any development activities that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate.

9. REFERENCES

Aerial view of development location as well as Site Distribution: Courtesy Google Earth

Topographic Location of development: Courtesy Map Source 2010

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APPENDIX A

Definition of terms:

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artifacts, found on a single location.

Structure: A permanent building found in isolation or which forms a site in conjunction with other structures.

Feature: A coincidal find of movable cultural objects.

Object: Artifact (cultural object).

(Also see Knudson 1978: 20).

APPENDIX B

Cultural significance:

- Low — A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.

- Medium — Any site, structure or feature being regarded less important due to a number of factors, such as date and frequency. Also any important object found out of context.

- High — Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorized as of a high importance. Also any important object found within a specific context.

APPENDIX C

Heritage significance:

- Grade I — Heritage resources with exceptional qualities to the extent that they are of national significance

- Grade II — Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate

- Grade III — Other heritage resources of local importance and therefore worthy of conservation

APPENDIX D

Protection of heritage resources:

- Formal protection

National heritage sites and Provincial heritage sites – grade I and II
Protected areas - an area surrounding a heritage site
Provisional protection – for a maximum period of two years
Heritage registers – listing grades II and III
Heritage areas – areas with more than one heritage site included
Heritage objects – e.g. archaeological, palaeontological, meteorites, geological specimens, visual art, military, numismatic, books, etc.

- General protection

Objects protected by the laws of foreign states
Structures – older than 60 years
Archaeology, palaeontology and meteorites
Burial grounds and graves
Public monuments and memorials